REMARKS

Claims 1-20 remain in the present application. Applicants respectfully request further examination and reconsideration of the rejections based on the above amendments and the arguments set forth below.

Provisional double patenting rejection

The above referenced Office Action cites a provisional rejection of independent Claims 1, 7 and 14. Applicants correspond to the provisional double patenting rejection upon an indication of allowance of subject matter of either the present application or the co-pending application (09/975,338).

35 U.S.C. Section 103 rejections

The above referenced Office Action rejects independent Claims 1, 7 and 14 as being unpatentable over U.S. Patent No. 5,748,875 (hereafter Tori) in view of "Debugging with the GNU Source-Level Debugger" (hereafter Stallman). Applicants respectfully traverse.

Embodiments of the claimed invention as recited in, for example, independent Claim 7, disclose a method of establishing a breakpoint in a microcontroller in an in-circuit emulation system. As recited in independent Claim 7, a microcontroller and a virtual microcontroller execute a sequence of instructions in lockstep synchronization. A break point lookup table is stored

in a virtual microcontroller. At each instruction of the sequence of instructions, the breakpoint lookup table in the virtual microcontroller is inspected for a set break bit associated with the instruction. If a break bit is set, a break message is sent to the microcontroller to implement a break in instruction execution.

Importantly, as explicitly recited, the break message is sent to the microcontroller. Applicants respectfully assert that this is different from a break instruction opcode, such as, for sample, a halt or break opcode, being executed by the microcontroller as part of its programmed instructions. The break is implemented through a message being transmitted to the microcontroller (e.g., from a host computer). Thus, program code executing on the microcontroller or other device under test does not have to be altered.

This completely different than the disclosure of Tori and Stallman. Tori is relied upon to show a virtual processor operating in lockstep with a second processor. Applicants do not understand any portion of the cited figure 3 of Tori as showing, suggesting, or teaching the use of a breakpoint lookup table executing on a host as in the claimed invention. Applicants find no showing, suggesting, or teaching for the use of lookup table break bits associated with each of a plurality of instruction addresses, where a break bit being set indicates that a break is to occur at the specified instruction address. Furthermore, Applicants find no showing, suggestion, or teaching

for the sending of a break message to the microcontroller whenever an instruction address is encountered that is associated with a set break bit.

The deficiencies of Tori are not cured by Stallman. Applicants have reviewed the cited section of the Stallman reference (e.g.," setting breakpoints"). The cited section of the Stallman reference explicitly teaches setting breakpoints with a break command or its variants to specify places where a program should stop by line number, function name, or exact address in the program. Applicants assert that this is completely different than the claimed invention. Stallman teaches setting breakpoints directly in the program. The cited section of Stallman goes through numerous examples of the various opcodes that must be used to implement breakpoints within the program.

In contrast, the claimed invention requires no alteration to the program. When matches are made in the lookup table with break bits set, the break point is implemented. Importantly, a break message is sent to the microcontroller causing it to halt. The break is not required to be executed as an opcode of the microcontroller's program. This renders the claimed invention completely different from any Tori and Stallman combination. In fact, since Stallman explicitly teaches the incorporation of differing variants of break opcodes directly into a program executing on the device under test (or virtual device under test), Stallman teaches away from the claimed

invention, which requires no alteration of the program executing on the device under test.

Accordingly, for the rationale described above, Applicants traverse any "Official Notice" with regard to the setting of break points and the implementation of break messages as recited in the claimed invention. For the rationale described above, Applicants assert that the claimed invention as recited in independent Claims 1, 7 and 14 is not rendered obvious by the combination of Tori and Stallman when the meaning of 35 U.S.C. Section 103

CONCLUSION

Applicants respectfully assert that all claims (Claims 1-20) are in condition for allowance and Applicants earnestly solicit such action from the Examiner.

The Examiner is urged to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Please charge any additional fees or apply any credits to our PTO deposit account number: 23-0085.

Respectfully submitted,

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Dated: 8/5, 2005

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IN THE DRAWINGS

Applicant has included herein a replacement sheet and an annotated sheet for Figure 4 of the drawings of the present application. The replacement sheet corrects a typographical error.